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an increase of tannin deposits, and a reduction in the annual ring. An important point is that the stomata play no particular part in the absorption of the injurious vapors; the whole leaf appears to be involved in the process.

Plants vary widely in their power of resistance to noxious vapors; this might be anticipated in the case of different plant species, but it is strongly true as well among different individuals of the same species. Harmful effects are accelerated when there is an increase of light, heat or drouth, and as might be supposed therefrom, one of the first signs of injury is a drying out of the leaf, due to an impeded circulation of water. In a similar manner, though much less fully, the injurious influences of other smokes and vapors are discussed, *e. g.*, chlorin, hydrochloric acid, hydrofluoric acid, nitric acid, acetic acid, ammonia, hydrogen sulfid, bromin, tar, pyridin, phenol, fog, asphalt, illuminating gas, and dust. It will be seen from the list of subjects treated that the monograph considers all atmospheric elements apart from those which are commonly regarded as normal, whether or not they may be classed under the head of smokes or vapors. The book abounds in examples that have been taken from a wide field experience. For this and other reasons, the work will prove of great value to foresters, and to all who cultivate plants in the vicinity of cities or factories. And the botanist also will find here for the first time, perhaps, the injurious effects of smokes and vapors presented in such a way as to permit of ready reference.—H. C. COWLES.

#### Classification of flowering plants.<sup>4</sup>

MR. A. B. RENDLE has undertaken to present to the somewhat advanced student "a systematic account of the flowering plants," and the first volume, now before us, comprises the gymnosperms and monocotyledons. It may be said that the emphasis is laid upon classification, as the title would imply, rather than upon morphology. The essential morphology of the great groups is outlined briefly, but systematically and clearly, the modern point of view and terminology largely dominating, although it did not seem possible for the author to eliminate sexual terms entirely from the terminology of sporophytic structures.

The author regrets that "the means available did not allow of the preparation of large figures," for this feature of the book is out of all proportion to the value of the text. However, he has done remarkably well with the limitations that were set for him.

One of the most interesting chapters in the book is the first one, dealing with the evolution of plant classification. The subject is one which the author's experience has peculiarly fitted him to treat, and this chapter is one of the best compact presentations of it for the general student that we have seen.

Naturally the large usefulness of the book is in its full account of the plant groups, in which there is brought together a mass of information that will be of

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<sup>4</sup> RENDLE, ALFRED BARTON, *The classification of flowering plants*. Vol. I. *Gymnosperms and Monocotyledons*. 8vo. pp. xiv + 403. Cambridge Biological Series. Cambridge: The University Press. 1904. \$3.50.

great service to those who are not extreme specialists in the classification of seed-plants. The collated literature is supplemented by the large experience of the author, so that in a sense the presentation is distinctly a fresh one.

This book and others like it serve to emphasize the increasing differentiation between the specialists in morphology and those in classification. It is no longer possible for one man to do justice to both subjects in a single book. One or the other dominates in accordance with the larger interest of the author, and the other phase receives comparatively scant attention. In the book before us taxonomy is dominant, and only that amount of morphology is presented which is supposed to be of importance to a specialist in taxonomy. In other books morphology is dominant and taxonomy reduced to a bare outline. There is an additional complication in the case of seed-plants because of an old morphology that belongs to them. The old morphology has more dealings with taxonomy than it does with the new morphology, and will doubtless continue to be exploited chiefly by taxonomists. Anatomy has already become distinctly differentiated as a subject, and the morphologist of either kind has learned to touch it very lightly.—J. M. C.

#### MINOR NOTICES.

THE ISSUE of the twelfth edition of PRANTL'S *Lehrbuch der Botanik*, under the editorship of DR. PAX,<sup>5</sup> indicates that this book holds an assured place among German text-books. The present edition has been very slightly enlarged, though brought into line with modern work in many places. Improvements are also noticeable in many figures and some new ones are introduced.

Of its kind the book is excellent, but the kind no longer appeals to American botanists as a model. For it gives 122 pages to anatomy, 53 pages to physiology, and 279 to the dreary synopsis of plant families, which we suppose medical students and other victims of the required "allgemeine Botanik" are still forced to study—else it would hardly form so dominant a part of all German text-books. It might be well for our German friends to undertake a reform movement in botanical instruction.—C. R. B.

THE NINETEENTH PART of ENGLER'S *Das Pflanzenreich* consists of a presentation of Betulaceae by WINKLER.<sup>6</sup> The usual critical discussion of structure, geographic distribution, and systems of classification is followed by descriptions of 83 species recognized as representing 6 genera, all but 11 of the species belonging to *Betula* (37), *Carpinus* (18), and *Alnus* (17). In *Carpinus* 7 new species are described, and in *Betula* 3, but none of them belong to the American flora. Dr. BRITTON'S 4 new species of *Betula* recently described<sup>7</sup> are referred to in the *Addendum* as not examined. The conservative tendency of the work is indicated

<sup>5</sup> PAX, F., PRANTL'S *Lehrbuch der Botanik*. 12th ed. Imp. 8vo. pp. viii+478. figs. 439. Leipzig: Wilhelm Engelmann. 1904.

<sup>6</sup> ENGLER, A., *Das Pflanzenreich*. Heft 19. Betulaceae von HUBERT WINKLER. pp. 149. Leipzig: Wilhelm Engelmann. 1904. M 7.60.

<sup>7</sup> Bull. Torr. Bot. Club 31: 165. 1904.